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Hoverflies (Diptera: Syrphidae) from Vumba, Eastern Highlands of Zimbabwe, with the description of a new species of *Paragus*

by

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ABSTRACT

The Natal Museum Diptera collection contains the D. Cookson collection from Vumba in the Eastern Highlands of Zimbabwe, in which there are 440 specimens of hoverflies (Diptera: Syrphidae). This is one of the few large collections of hoverflies assembled by an individual collector from a single locality in Africa, and the only extensive collection from this particular locality. Not only is it thus significant as a collection, but it is also valuable as a conservation tool, providing a basic list of species from Vumba. In relation to this collection, the importance of the Eastern Highlands of Zimbabwe as a conservation area, is discussed. A new species of *Paragus (Pandasyopthalmus)* Stuckenberg, 1954, is described from the collection. Thirty five species and eight genera previously unrecorded from Zimbabwe, are listed.

INTRODUCTION

Hoverflies (Syrphidae) are distinctive and often colourful Diptera, generally popular among professional and amateur entomologists. In Africa, however, they remain understudied, with few works on ecology, periodicity, conservation and general biology (see e.g. De Meyer & Maragia 1993; Schmutterer 1972*a,b* 1974). Apart from the fact that available researchers are thinly spread in Africa, the scarcity of biological work may be a result of inadequate identification keys, often causing difficulties in identification of Syrphidae, where there is no access to an extensive reference collection. Thus, Syrphidae tend to be ignored (along with many other groups of insects) in faunal surveys. The keys that do exist are, nevertheless, an asset to identification. The most important of these are: Bezzi 1915; Curran 1927 1938*a,b* 1939*a,b*; Stuckenberg 1954*a,b*; Hull 1964; Vockeroth 1973; Hippa 1985 1990. Some of these keys are now out-dated and do not cover all species from the region.

Although conservation studies including hoverflies in Africa are limited, a few recent publications do exist, enabling further comparative studies on distribution and biodiversity to be carried out. At present these generally centre on East Africa, including: De Meyer *et al.* 1990 (Comoros), De Meyer & Whittington 1993 (East Africa), Whittington 1994 (Afrotropics), De Meyer *et al.* 1995 (East Africa), De Meyer *et al.* 1996 (East Africa). Hopefully, similar studies will be undertaken elsewhere, to provide a better understanding of the distribution of Syrphidae in Africa.

There are also relatively few good collections of hoverflies from single localities, or from individual countries, that are sufficiently comprehensive to be used for baseline reference data. Most such data are pieced together from a number of sources.

Father and son Van Someren assembled large collections, including hoverflies from East Africa. Much of their material is in The Natural History Museum, London and the National Museums of Kenya in Nairobi. Dr H. Brauns collected Diptera extensively, including hoverflies, in the Willowmore district of South Africa, and Dr B. R. Stuckenberg collected widely in southern Africa. Both of these extensive collections are in the Natal Museum, South Africa, arguably the most important Diptera collection in Africa (see Barraclough & Whittington 1994). Smaller collections from Zimbabwe by R. H. R. Stevenson, E. C. G. Pinhey and G. van Son are also in the Natal Museum and the Natural History Museum in Bulawayo, Zimbabwe, supplemented over the years by the staff there.

A much overlooked, but extremely important collection of Syrphidae from Vumba, in the Eastern Highlands of Zimbabwe, was made by David Cookson in the 1960s, and was subsequently donated to the Natal Museum. Cookson's dedication and interest is clearly expressed in the tribute to him by Dr Stuckenberg, at the beginning of a posthumous paper (Cookson 1967).

The Cookson collection contains 440 hoverfly specimens in 26 genera, and includes at least 63 species. These species are listed below, supplemented with material from the Natural History Museum in Bulawayo. The bulk of the Cookson specimens were collected at Vumba between April 1963 and May 1966 inclusive, with a few specimens taken earlier in January 1955. This material was largely identified by Dr Stuckenberg and P. H. van Doesburg, Jr., with later determinations by myself.

The holotype of *Myolepta triangularis* Thompson, 1974, the three female paratypes of *Episyrphus petilis* Vockeroth, 1973, and the holotype of the species described in this paper, are the only syrphid types among this material.

As mentioned above, the Cookson collection contains specimens of numerous other Diptera families. Many of these have yet to be examined in detail, and others have already formed part of the material examined for taxonomic revisions, including: Barraclough 1985 (Tachinidae) and 1993 (Neriidae); Duckhouse 1975 (Psychodidae); Freidberg & Hancock 1989 (Tephritidae); Londt 1989 (Asilidae); Rohácek 1993 (Anthomyzidae); Tsacas 1990 (Drosophilidae).

The acronyms NMSA and NMBZ refer to the Natal Museum (South Africa) and the Natural History Museum, Bulawayo (Zimbabwe) respectively.

TAXONOMY

Paragus (Pandasyopthalmus) cooksoni sp. n.

Figs 1–5

Etymology: Named in honour of David Cookson.

Diagnosis: Head large; face flattened (without tubercle or facial stripe); thorax and abdomen coarsely punctate; mesonotal pile short and fine, golden in colour; legs pale reddish-brown; abdomen apetiolate, completely black and lacking pruinescent marks; second abdominal segment half as long as wide; vestiture poorly developed; male postabdomen having superior claspers with ventrobasal spur.

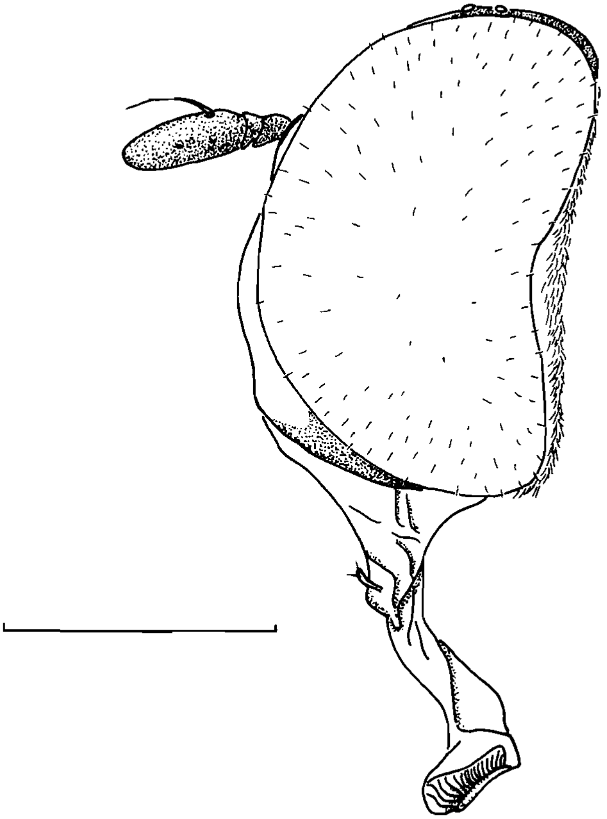


Fig. 1. Lateral view, head, *Paragus* (*Pandasyopthalmus*) *cooksoni* sp. n., male holotype. Scale bar = 1 mm.

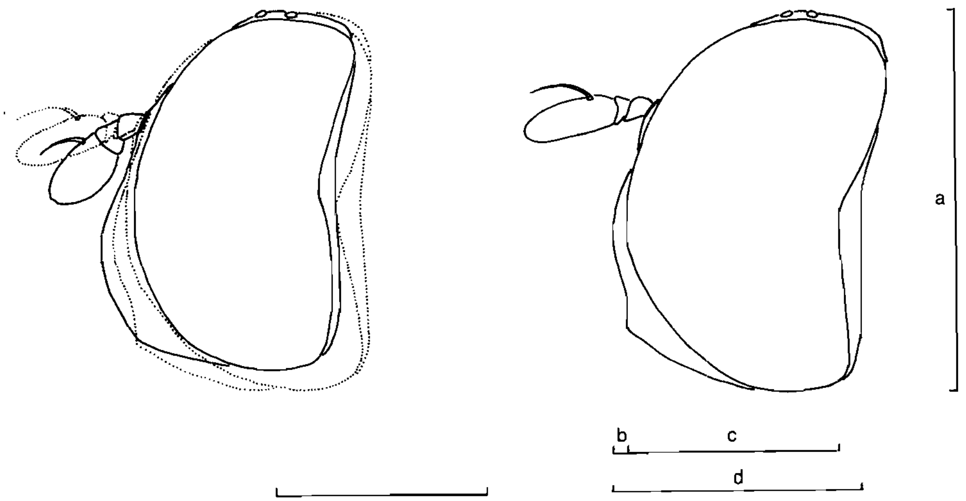
Type material: ♂ Holotype: 'N.Vumba, / S.Rhodesia / 8.5.1965 / D.Cookson.' [small rectangular white label, photographically produced, with date handwritten]; 'HOLOTYPE / *Paragus* / (*Pandasyopthalmus*) / *cooksoni* sp.n. ♂ / Det. Whittington' [large rectangular red label with first and last lines printed, middle lines handwritten]. Deposited in NMSA.

Type locality: North Vumba [*ca.* 19° 06'S; 32° 46'E], Zimbabwe

Body length: 5.5 mm; wing length: 4.6 mm.

Description:

Head (Fig. 1): Eyes strongly developed and dominating (eye width five sixths of head width [Fig. 3; c/d = 0.8]; eye width 0.6 of eye length [Fig. 3; c/a = 0.6]); vestiture sparse and short. Face narrow in lateral view [Fig. 3; b/d = 0.1] and in frontal view; orange-yellow. Buccal margin blackened at posterior end. Frons black, apical triangle densely white pruinose. Facial triangle (i.e. between constriction of eyes and insertion of antennae) minute and brown, covered with short white setae. Antennae grey-brown above, slightly redder ventrally. Width of third segment half its length. Sacculae organs numerous, small and scattered. Postocciput and postgena densely covered with thick white setae.



Figs 2 & 3. Profile, head, *Paragus* (*Pandasyopthalmus*) *cooksoni* sp. n., male holotype (dotted line) superimposed on profile of *Paragus* (*Pandasyopthalmus*) *minutus* Hull, 1938 (solid line). Scale bar = 1 mm.

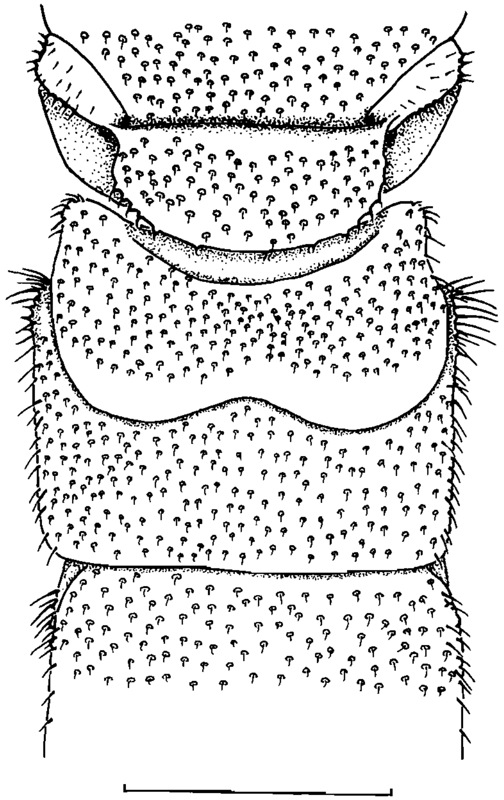


Fig. 4. Dorsal view, scutellum and first three abdominal segments, *Paragus* (*Pandasyopthalmus*) *cooksoni* sp. n., male holotype. Scale bar = 1 mm.

Thorax: Black with coarse punctation, each puncture with a seta. Vestiture on notum fine and golden, elsewhere short and white, but long, dense and white on anterior mesopleuron. Postalar callus and base of scutellar margin with wart-like tubercles giving rise to fine dark setae (Fig. 4). Legs reddish-brown; apex of femora and base of tibiae slightly more yellow. Mid-coxal prong well developed. Wings with microtrichia covering membrane; membrane suffused-brown; pterostigma elongate and brown. Veins brown. Brown spot present on *vena spuria*, a little beyond halfway along first basal cell. Calypter creamy-white, fringed with long, branched, white setae.

Abdomen: Not conspicuously petiolate, second segment only fractionally narrower distally than proximally (Fig. 4). First segment with shining distal margin, free of setation. Second segment distinctly wider than long. Punctation pronounced, each puncture with a seta. Vestiture short, but slightly longer on proximal lateral edge.

Male postabdomen (Fig. 5): Epandrium saddle-shaped and longer than deep. Cerci rounded and narrow, weakly setose. Style narrow and tapering apically. Superior claspers rounded with a distinctive venterobasal spur (Fig. 5a). Penis-sheath about as deep as epandrium. Lingula strongly developed with medial groove strongly incised (Fig. 5b).

Distribution: Known only from the type locality.

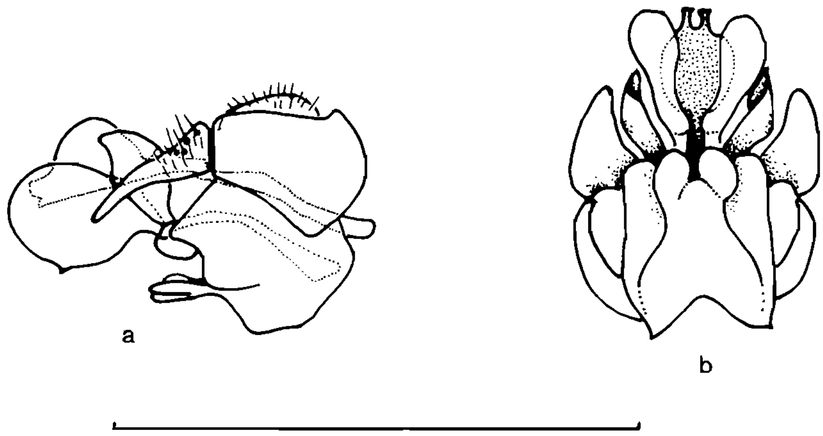


Fig. 5. Postabdomen, *Paragus* (*Pandasyopthalmus*) *cooksoni* sp. n., male holotype, a) lateral view, b) ventral view. Scale bar = 1 mm.

Discussion: For the sake of consistency, I have deliberately used the same terminology as that used by Stuckenberg (1954*a*), rather than that used more recently by Vockeroth & Thompson (1987).

Paragus (*P.*) *cooksoni* clearly belongs to the *longiventris*-group of *Pandasyopthalmus*, having a flattened, non-tuberculate face and males without facial stripes. The abdomen is scarcely petiolate, but certainly not parallel-sided or diminishing distally, as is the case in the *tibialis*-group. The wings are suffused and covered with fine microtrichia and the frontal triangle is black, as in *P.* (*P.*) *gracilis*

Stuckenberg, 1954, although the abdomen is clearly different from that of *P.* (*P.*) *gracilis*.

Aside from these *gracilis*-like characters, *P.* (*P.*) *cooksoni* most closely resembles *P.* (*P.*) *minutus* Hull, 1938. Both species share the following character states:

- No facial stripe in male
- No facial tubercle
- Pile on notum golden and very short (in *cooksoni* the pile is shorter than in *minutus*)
- Wart-like tubercles present on postalar callus and base of scutellar margin
- Punctation on thorax and abdomen coarse
- Abdomen only moderately constricted at base
- Second abdominal segment wider than long
- Well-developed superior claspers in male

In the keys to afrotropical species of *Pandaysopthalmus* (Stuckenberg 1954*a*: 102–105), *P.* (*P.*) *cooksoni* runs to couplet 6 based on external features, and between couplets 6 and 7 based on male genital features. It differs from *minutus* in the following characters (character states of *minutus* in parentheses):

- Eye large in comparison to head size, b/d = 0.6, Figs 2 & 3 (smaller in comparison, b/d = 0.5, Figs 2 & 3)
- Facial width narrow in comparison to head width, a/c = 0.1, Figs 2 & 3 (wider in comparison, a/c = 0.2, Figs 2 & 3)
- Length of third antennal segment twice the shorter dimension in lateral view (less than twice shorter dimension)
- Tergites 3 and 4 lack anterolateral wedge-shaped depressions filled with white setae (with wedge-shape depressions filled with white setae)
- Superior claspers in male rounded with a ventrobasal spur (boomerang-shaped, smooth along ventral margin)
- Style in male narrow and pointed towards apex (broad and dilated towards apex)
- Abdomen entirely black (with fifth tergite reddish)

Furthermore, there is close affinity between *P.* (*P.*) *cooksoni* and *P.* (*P.*) *stuckenbergi* De Meyer (1998); *stuckenbergi* differs from *cooksoni* in that the wing apex has a black spot, the hind tibia is curved, and the male postabdomen is substantially different. The superior claspers of *stuckenbergi* are narrow and curve downwards, and the lingula is broad and square with a shallow median groove, reminiscent of *P.* (*P.*) *marshalli* Bezzi, 1915.

DISCUSSION

Barraclough (1994) and Duxbury & Barraclough (1994*a*,*b*) make the point that invertebrates are too infrequently considered when southern African biodiversity and conservation issues are addressed. Indeed, in 1962, Stuckenberg stated that many invertebrate groups are both poorly known and under-collected. It is hoped that the inventory of syrphid taxa from David Cookson's Vumba collection, will help address these deficiencies, albeit in a small way. When added to other significant papers on the distribution and conservation of Syrphidae in Africa (De Meyer & Maragia 1993;

De Meyer & Whittington 1993; Whittington 1994; De Meyer *et al.* 1995, and De Meyer *et al.* 1996), a more complete picture of species associations begins to emerge. It is clear that many species are more widely distributed than previously believed.

The alphabetical list of species is based on material from the Natal Museum, supplemented with material from the Natural History Museum in Bulawayo (Table 1). In the case of the latter material, the acronym NMBZ follows the species name. Some material from NMBZ is from the nearby farm: Cloudlands (2000 m), collected 2–15.ii and 6–17.iv.1923. All specimens seen from NMBZ have no collector specified and all have an indication on the label that the specimens are the property of the museum (under various names). *Eumerus assimilis* Doesburg, 1955 and *Eumerus erythrocerus* Loew, 1858 are from the Umtali District, collected by P. A. Sheppard on 25 September 1931, and February and March 1931 respectively (Doesburg 1955).

TABLE 1

Syrphidae from Vumba, Zimbabwe, with reference to their wider African distribution. The symbol † = species endemic to Vumba. Species in **bold** were not recorded from Zimbabwe in Smith & Vockeroth (1980) or in subsequent revisions (e.g. Hippa 1985 1990; Vockeroth 1973; Whittington 1992 1994).

	Afrotropical Distribution More specific lists of country data are given in Smith & Vockeroth (1980)					
Species recorded from Vumba	West	Central	East	Southern	Atlantic Islands	Indian Ocean Islands
***Allobaccha claripennis* (Loew, 1858)**		●		●		
***Allobaccha cuthbertsoni* (Curran, 1938)**			●	●		
***Allobaccha eclara* (Curran, 1938)**			●	●		
***Allobaccha helva* (Bezzi, 1915)**			●	●	●	
***Allobaccha neavei* (Bezzi, 1915)**			●	●		
Allobaccha sapphirina (Wiedemann, 1830)	●	●	●	●		
Asarkina (Asarkina) africana Bezzi, 1908	●	●	●	●		
***Asarkina (Asarkina) eremophila* Loew, 1858**		●	●	●		
***Betasyrphus adligatus* (Wiedemann, 1824)**	●	●	●	●		
***Betasyrphus claripennis* (Loew, 1858)**		●	●	●		
***Betasyrphus hirticeps* (Loew, 1858)**			●	●		
Betasyrphus suandersi (Goot, 1964): (and in **NMBZ**)		●	●	●		
***Chrysogaster laevigata* Bezzi, 1915**	●			●		
Episyrphus petilis Vockeroth, 1973				●		
Episyrphus trisectus (Loew, 1858)	●	●	●	●	●	●
***Eristalinus aeneus* (Scopoli, 1763)**			●	●		●
Eristalinus dissimilis (Adams, 1905)				●		

TABLE 1 (continued)

Syrphidae from Vumba, Zimbabwe, with reference to their wider African distribution. The symbol † = species endemic to Vumba. Species in **bold** were not recorded from Zimbabwe in Smith & Vockeroth (1980) or in subsequent revisions (e.g. Hippa 1985 1990; Vockeroth 1973; Whittington 1992 1994).

	Afrotropical Distribution More specific lists of country data are given in Smith & Vockeroth (1980)					
Species recorded from Vumba	West	Central	East	Southern	Atlantic Islands	Indian Ocean Islands
Eristalinus dubiosus **(Curran, 1939)**	●		●	●		
Eristalinus fuscicornis **(Karsch, 1887)**		●	●	●		
Eristalinus myiatropinus **(Speiser, 1910)**		●	●	●		
Eristalinus quinquelineatus **(Fabricius, 1781)**	●	●	●	●	●	●
Eristalinus taeniops (Wiedemann, 1818)	●		●	●	●	
Eristalinus trizonatus **(Bigot, 1858)**	●	●	●	●		
Eristalis plumipes **Bezzi, 1912**	●	●		●		
Eumerus assimilis Doesburg, 1955				†		
Eumerus erythrocerus Loew, 1858			●	●		
Eumerus triangularis **Hervé-Bazin, 1913: (NMBZ)**		●	●	●		
Exallandra cinctifacies **(Speiser, 1910)**	●	●	●	●		
Graptomyza signata (Walker, 1860)		●	●	●		
Graptomyza suavissima Karsch 1888	●		●	●		
Hovaxylota hancocki **(Curran, 1927): (NMBZ)**		●	●	●		
Ischiodon aegyptius (Wiedemann, 1830)	●	●	●	●	●	●
Mesembrius lagopus (Loew, 1860)		●	●	●		
Metasyrphus corollae **(Fabricius, 1794)**	●		●	●		●
Microdon (Microdon) brevicornis **Loew, 1858**	●	●	●	●		
Milesia arnoldi (Malloch, 1932)		●		●		
Myolepta triangularis Thompson, 1974				†		
Paragus (Pandasyopthalmus) cooksoni Whittington, 1998				†		
Paragus (Pandasyopthalmus) dolichocerus Bezzi, 1915			●	●		
Paragus (Pandasyopthalmus) haemorrhous Meigen, 1822	●	●	●	●		
Paragus (Pandasyopthalmus) longiventris Loew, 1858	●	●	●	●	●	●
Paragus (Pandasyopthalmus) marshalli Bezzi, 1915	●	●	●	●		
Paragus (Pandasyopthalmus) minutus Hull, 1938	●	●	●	●		
Paragus (Pandasyopthalmus) naso **Stuckenberg, 1954**			●	●		
Paragus (Pandasyopthalmus) punctatus **Hull, 1949**			●	●		
Paragus (Paragus) borbonicus Macquart, 1842	●	●	●	●	●	●

TABLE 1 (Continued)

Syrphidae from Vumba, Zimbabwe, with reference to their wider African distribution. The symbol † = species endemic to Vumba. Species in **bold** were not recorded from Zimbabwe in Smith & Vockeroth (1980) or in subsequent revisions (e.g. Hippa 1985 1990; Vockeroth 1973; Whittington 1992 1994).

	Afrotropical Distribution More specific lists of country data are given in Smith & Vockeroth (1980)					
Species recorded from Vumba	West	Central	East	Southern	Atlantic Islands	Indian Ocean Islands
Paragus (Paragus) capricorni Stuckenberg, 1954		●	●	●		●
***Phytomia bulligera* (Austen, 1909)**	●	●	●	●		
***Phytomia incisa* (Wiedemann, 1830)**	●	●	●	●		●
***Phytomia natalensis* (Macquart, 1850)**	●	●	●	●		
Rhingia (Rhingia) caerulescens Loew, 1858: (and in **NMBZ**)		●	●	●		
Rhingia (Rhingia) fuscipes Bezzi, 1915		●	●	●		
***Rhingia (Rhingia) mecyana* Speiser, 1910: (NMBZ)**	●	●	●	●		
Rhingia (Rhingia) trivittata Curran, 1929		●	●	●		
***Senaspis dentipes* (Macquart, 1842)**	●	●	●	●		
***Senaspis dibapha* (Walker, 1849)**	●	●	●	●		
***Senaspis elliotti* Austen, 1909**		●	●	●		
Senaspis haemorrhoa (Gerstaecker, 1871)		●	●	●		●
***Simoides pachymera* (Wiedemann, 1819)**	●	●	●	●		
***Simoides villipes* (Loew, 1858)**			●	●		
Sphiximorpha globigaster (Hull, 1944) **(NMBZ)**				●		
Sphiximorpha unipunctata (Doesburg, 1956)				†		
***Syrittosyrphus opacea* Hull, 1944**				●		

Comparing Table 1 with data in Smith & Vockeroth (1980), there are eight widely distributed genera newly recorded in Zimbabwe. Their previous omission must surely be the result of collecting bias:

Chrysogaster Meigen, 1803
Exallandra Vockeroth, 1969
Hovaxylota Keiser, 1971
Metasyrphus Matsumura *in* Matsumura & Adachi, 1917
Microdon Meigen, 1803
Phytomia Guérin-Méneville, 1834
Simoides Loew, 1858
Syrittosyrphus Hull, 1944

Furthermore, there are a number of species not encountered in the Vumba material, which, based on the Afrotropical Catalogue (Smith & Vockeroth 1980), do occur in Zimbabwe. These are divided into two lists:

1. Seven species not in Table 1. As they are widespread in the Afrotropical Region, they are assumed to occur in Zimbabwe:

Allograpta nasuta (Macquart, 1842)
Asarkina (Asarkina) ericetorum (Fabricius, 1781)
Asarkina (Asarkina) punctifrons Austen, 1909
Ceriana ammophilina (Speiser, 1910)
Eristalis tenax (Linnaeus, 1758)
Mallota aenigma Bezzi, 1912
Syritta flaviventris Macquart, 1842

2. The following 28 species do not occur in Table 1, but are known to occur in Zimbabwe:

Allobaccha brevis (Karsch, 1887)
Allobaccha ichneumonea (Bezzi, 1915)
Asarkina (Asarkina) gemmata Bezzi, 1915
Ceriana pulchra (Hervé-Bazin, 1913)
Eristalinus aequalis (Adams, 1905)
Eristalinus longicornis (Adams, 1905)
Eumerus axincerus Speiser, 1910
Eumerus obliquus (Fabricius, 1805)
Eumerus serratus Bezzi, 1915
Eumerus vansoni Doesburg, 1955
Mallota dasyops (Wiedemann, 1819)
Melanostoma bituberculatum (Loew, 1858)
Melanostoma gymnocera Bigot, 1891
Melanostoma infuscatum Becker, 1909
Melanostoma scalare (Fabricius, 1794)
Merodon cuthbertsoni Curran, 1939
Merodon stevensoni Curran, 1939
Mesembrius senegalensis (Macquart, 1842)
Paragus (Paragus) pusillus Stuckenberg, 1954
Pseudodoros nigricollis Becker, 1903
Rhingia (Eorhingia) cuthbertsoni Curran, 1939
Rhingia (Rhingia) pellucens Bezzi, 1915
Sphiximorpha bezzii (Hervé-Bazin, 1913)
Sphiximorpha dilatipes (Brunetti, 1929)
Sphiximorpha speiseri (Hervé-Bazin, 1913)
Sphiximorpha swierstrai (Doesburg, 1955)
Sphiximorpha ugandana (Kertész, 1913)
Syritta bulbus Walker, 1849

This second list, plus that in Table 1, therefore provides a total of 91 species for Zimbabwe. Additional undetermined material in NMSA, in the following genera, has not been included, because the genera are undergoing or are in need of revision:

Chrysogaster Meigen, 1803
Eumerus Meigen, 1822
Melanostoma Schiner, 1860
Microdon (Microdon) Meigen, 1803
Syritta Le Peletier & Serville, 1828

Some species exhibit anomalous distributions. For example, the Vumba specimens of *Chrysogaster laevigata* Bezzi, 1915, agree well with Bezzi's (1915) description. The only discernible difference is that the second *and* third abdominal segments have median black pruinescent marks, rather than only the second segment as described by Bezzi. Furthermore, these marks are pointed apically, not rounded. The species was formerly known only from Ghana and since the genus is in need of revision (Maibach, *pers. comm*), a definite identification must wait further analysis. For now the species is included in this list, but it is either misidentified or the species is more widely distributed across Africa than previously supposed.

There are other examples of species which are probably very widespread, but for which we have insufficient data. A species new to the Zimbabwe list is *Eristalinus aeneus* (Scopoli, 1763). This is a cosmopolitan species conspicuous in its absence from previous afrotropical lists, but probably widespread in the Afrotropics. It was recorded from Tanzania by Smith & Vockeroth (1980) and also from Kenya (De Meyer *et al.* 1995). It is known, in addition, from Austria, Mauritius, South Yemen, Egypt, Europe, the Pacific Islands and the U.S.A. Some West African species (such as *Eristalinus trizonatus* (Bigot, 1858) and *Eristalis plumipes* Bezzi, 1912 – both new to the Zimbabwe list) are clearly range extensions. This is supported by the presence of specimens of both species in NMSA from the east coast of South Africa.

It is noteworthy that 35 (55 %) of the 63 taxa listed in Table 1 (or 38 % of the 91 species now known from Zimbabwe), were previously not recorded from Zimbabwe. Our current knowledge of the distribution of the afrotropical syrphid fauna is obviously limited and needs improvement. That our knowledge is so sketchy, has negative implications for comments concerning endemism. Of the 44 East African endemic taxa listed by De Meyer *et al.* (1995), three exist in the material from Vumba, and therefore should be omitted from De Meyer's list. These three species are:

Graptomyza suavissima Karsch, 1888, inadvertently listed as an East African endemic. Previously known from Nigeria, East Africa and Mozambique (Whittington 1992).

Paragus (Pandasyopthalmus) naso Stuckenberg, 1954, formerly only known from Kenya and Tanzania. Not previously listed from Zimbabwe, but present in the Vumba material.

Senaspis dentipes (Macquart, 1842), also inadvertently included as an East African endemic, but known to be more widespread. Not previously listed from Zimbabwe.

Of the 63 species recorded in Table 1, only 4 are presently known exclusively from Vumba. These are *Eumerus assimilis* Doesburg, 1955, *Myolepta triangularis* Thompson, 1974, *Paragus (Pandasyopthalmus) cooksoni* sp. n., and *Sphiximorpha unipunctata* (Doesburg, 1956). It should be noted that this endemism is possibly only apparent. *Myolepta triangularis* is a canopy dweller (Stuckenberg *in litt.* in Thompson, 1974), which may account for the apparent scarcity of specimens (Thompson 1974). *Eumerus assimilis* Doesburg, 1955 and *Paragus (Pandasyopthalmus) cooksoni* sp. n. are known from single specimens and may be more widely distributed.

Revisionary work, in which an attempt to examine all material of a particular taxonomic group is made, provides a basis from which better statements about endemism and conservation can be made (see e.g. Barraclough 1994; Duxbury & Barraclough 1994*b* (family level analysis) and Whittington 1992 1994 (generic level analysis).

Despite our poor knowledge of distribution patterns, there is sufficient evidence to suggest that Vumba is an area of conservation importance. The value of the Eastern Highlands of Zimbabwe (Vumba Mountains, Mt. Nusa and Mt. Inyangani), as part of the Afromontane mist-belt highland system, is undoubted. Within this system lies Vumba (*ca.*19°06'S; 32°46'E), or more precisely, Bvumba, a locality name from Shona meaning 'Misty' or 'Drizzle' (K. Donnan, *in litt.* 3 November 1995). The locality should not be confused with a town called Vumba, which is in Mozambique, 10–15 km south of Vila de Manica (18°56'S; 32°52'E). The Cookson home was located on the Estate 'Laurenceville' in the mountains, at an altitude between 1 400 and 1 800 m, and about 12 km southeast of Umtali. Further NMBZ material labelled 'Cloudlands', and 'Umtali' are from closely approximated localities.

The Southeastern Highlands noted by Barraclough (1994), Duxbury & Barraclough (1994*b*), and the Eastern Highlands within which is Vumba, are part of a longer and more extensive range of high altitude mountains along the east of Africa. Theron & Donald (1992) divided this fragmented system of mountains into seven Afromontane regional categories. They state that the future of these temperate broadleafed forest areas is in the balance, due to extensive and mixed exploitation of the resource. The faunas associated with these high altitude temperate forests and the adjacent grasslands have a distinct form, extending from the Cape fold belt northwards (Stuckenberg 1962).

There is an urgent need to conserve areas of Afromontane forest and associated (or adjacent) grasslands (Barraclough 1994; Duxbury & Barraclough 1994*b*). The Southeastern Highlands of Zimbabwe (Mt. Selinda and Chimanimani National Park) were included among the areas noted for conservation assessment. It is evident that the Eastern Highlands should receive similar conservation protection.

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